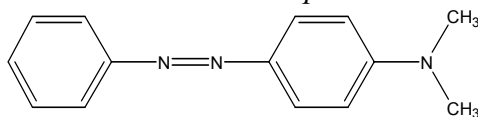


## 4-DIMETHYLAMINOAZOBENZENE

CAS No. 60-11-7

First Listed in the *Second Annual Report on Carcinogens*



### CARCINOGENICITY

4-Dimethylaminoazobenzene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity in experimental animals (IARC S.4, 1982; IARC S.7, 1987). When administered orally in the diet, 4-dimethylaminoazobenzene induced lung tumors and hepatomas in mice and liver tumors in rats, including solid, alveolar, trabecular, or adenomatous tumors, with some metastases. In dogs, this chemical produced bladder papillomas when administered in the diet (IARC V.8, 1975). Subcutaneous injections of 4-dimethylaminoazobenzene induced hepatomas and liver carcinomas, and local sarcomas and fibrosarcomas in adult mice; liver tumors and lung adenomas were induced in newborn mice. The same route of administration induced metastasizing liver tumors in rats. Intraperitoneal injections induced hepatomas in rats. Skin painting with 4-dimethylaminoazobenzene in acetone induced squamous cell, basal cell, and anaplastic carcinomas plus other miscellaneous epidermal tumors in rats but not in mice.

There are no data available to evaluate the carcinogenicity of 4-dimethylaminoazobenzene in humans (IARC V.8, 1975; IARC S.7, 1987).

### PROPERTIES

4-Dimethylaminoazobenzene is a yellow crystalline solid that is insoluble in water and soluble in pyridine, benzene, strong mineral acids, and oils. When heated to decomposition, it emits toxic fumes of nitrogen oxides (NO<sub>x</sub>).

### USE

4-Dimethylaminoazobenzene is an industrial chemical previously used to color polishes and other wax products, polystyrene, and soap. It was also used as a chemical indicator for free hydrogen chloride (HCl) in juice, as a spot test identification of peroxidized fats, and as a pH indicator (IARC V.8, 1975; Merck, 1983; HSDB, 1998).

### PRODUCTION

4-Dimethylaminoazobenzene is not currently produced or used commercially in the United States (SRI, 1982; SRIa, 1997; HSDB, 1998). Sources (i.e., *Chemcyclopedia 98* and the 1998 *Chemical Buyers Directory*) indicate no current suppliers of the compound (Rodnan, 1997; Tilton, 1997). The 1979 TSCA Inventory identified two producers of 4-dimethylaminoazobenzene, with some site limitations (TSCA, 1979). No import data were available. In 1974, 4-dimethylaminoazobenzene was one of a group of at least twenty colors for

which individual production data were not available, but whose U.S. production as a group totaled 1 million lb. Large-scale production of 4-dimethylaminoazobenzene in the United States was first reported in 1914 (IARC V.8, 1975).

## EXPOSURE

The primary routes of potential human exposure to 4-dimethylaminoazobenzene are inhalation and dermal contact. It will bioconcentrate in aquatic organisms. NIOSH (NOES survey 1981-1983) estimated statistically that 1,454 workers were potentially exposed to 4-dimethylaminoazobenzene in the US. OSHA estimated that 2,500 workers were potentially exposed to 4-dimethylaminoazobenzene, possibly during the production of polishes, wax products, and polystyrene products in which 4-dimethylaminoazobenzene is used as a dye. Potential consumer exposure also may have occurred through contact with these products. In the atmosphere it will react with photochemically produced hydroxyl radicals (half-life 7.04 hour).

## REGULATIONS

EPA regulates 4-dimethylaminoazobenzene under the Clean Water Act (CWA), Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), and Superfund Amendments and Reauthorization Act (SARA). A reportable quantity (RQ) of 10 lb has been established for 4-dimethylaminoazobenzene under CERCLA and CWA. RCRA regulates 4-dimethylaminoazobenzene as a hazardous constituent of waste. Under SARA, 4-dimethylaminoazobenzene is subject to reporting requirements and general threshold quantities have been established for its use and manufacture. OSHA promulgated standards for 4-dimethylaminoazobenzene, based on its carcinogenicity, requiring protective clothing and hygiene procedures for workers, and engineering control measures for the manufacturing and processing of the chemical. OSHA regulates 4-dimethylaminoazobenzene under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-50.